



IDEM's Surface Water Quality Assessment Program

Biological Studies Section

Program Objective

The Biological Studies Section (BSS) conducts ecological assessments of Indiana surface waters, providing its customers direct measurement of environmental quality and information on any changes over time of this quality. The assessment of environmental quality involves the direct and indirect measurements of numerous parameters including: chemical analysis of water quality parameters, chemical analysis of surficial aquatic sediments, measurement of fish tissue contamination, the effects of toxic or thermal National Pollution Discharge and Elimination System (NPDES) effluents, aquatic habitat quality, fish community assessment, invertebrate community assessment, and lake eutrophication levels. The role of the BSS relative to these environmental media and the environmental indicators that we provide our customers are outlined in Table I.

The Biological Studies Section conducts studies of fish and macroinvertebrate communities, as well as stream habitats. This information is utilized to evaluate the biological integrity of aquatic communities of Indiana streams and lakes. This is accomplished through a variety of field and laboratory studies that involve several different forms of aquatic life. These data are used to determine compliance with the existing narrative biological criteria in Indiana's water quality standards, to determine the extent of ecological harm, and to make correlations to physical and/or chemical impairments which may occur.

This Section also conducts fish tissue and sediment sampling to monitor sources of toxic and bio-concentrating substances whose concentrations are often too low to be detected in other environmental media. Fish tissue data serve as the basis for fish consumption advisories which are issued to protect the health of those who consume fish caught in Indiana waters. Fish tissue data are also useful for wildlife health risk assessments for fish-eating birds and mammals and for providing the information needed to develop models for assessing changes in the quality of Indiana ecosystems.

The Section also oversees lake monitoring efforts conducted under contract by staff and students of the Indiana University School of Public and Environmental Affairs, as well as by a corps of trained volunteer monitors. Both programs include the monitoring of physical, chemical and/or biological parameters useful in assessing the impacts of nutrients in Indiana lakes and reservoirs.

The BSS participates in the review of requests for site-specific water quality criteria for waters influenced by NPDES discharges. In the course of its various monitoring and assessment field activities the staff finds point- and nonpoint source-related problems which are then referred to the appropriate IDEM programs. The Section also cooperates in monitoring and assessment of the Ohio River in conjunction with the Ohio River Valley Water Sanitation Commission (ORSANCO), and other state and federal agencies.

Table I. Role of the Biological Studies Section Relative to Media and Ecological Data Collected and Expressed in Terms of Environmental Stressors, Responses and Indicators		
Chemical, Physical and Biological Stresses	Environmental Responses	Environmental Indicators Used to Assess Impairment
Point Source Pollution and Nonpoint Source Pollution	Elevated Pollutants in Water	Water Chemical Specific Concentrations and Loadings
	Elevated Pollutants in Aquatic Sediments	Sediment Chemical Specific Concentrations and Loadings
	Elevated Pollutants in Fish Tissue	Contaminant Bioconcentration in Fish Tissue, Fish Consumption Advisories
	Acute and Chronic Toxicity	Effluent Toxicity Tests
Destructive Habitat Alterations	Decreased Aquatic Habitat Quality	Aquatic Habitat Evaluation Index
Collective Ecosystem Level Responses to Environmental Stress	Fish Community Impairment	Fish Community Index of Biotic Integrity (IBI)
	Invertebrate Community Impairment	Macroinvertebrate Index of Biotic Integrity (mIBI)
	Lake Eutrophication	Indiana Trophic State Index
		Carlson Trophic State Index

Program Participants

The Section works directly with the other sections of the Assessment Branch including the Surveys Section and the Environmental Toxicology and Chemistry Section. Work is conducted cooperatively with the Indiana Department of Natural Resources, Indiana State Department of Health, U.S.EPA, U.S. Geological Survey, U.S. Fish & Wildlife Service, U.S. Army Corps of Engineers, ORSANCO, local regulatory agencies, Indiana public and private school faculty and students. Internal customers include various programs within IDEM's Offices of Land and Water Quality (OLQ and OWQ, respectively). Ultimate customers are the citizens of Indiana.

Technical Notes

Please see the technical notes for the fact sheets listed in the Program Products section below.

Program Descriptions

Media: Surface water; rivers, streams and lakes

Study Area: Statewide

Site Selection Type: *see fact sheets listed in Program Products section*

Sampling Sites: *see fact sheets listed in Program Products section*

Sampling Frequency: *see fact sheets listed in Program Products section*

Data Collected: *see fact sheets listed in Program Products section*

Program Products

- < Fact Sheet: *Fish Community Sampling Program.* B-004-OLQ-AB-BS-98-R5 rev. Mar 2006
- < Fact Sheet: *Fish Tissue Contaminant Monitoring Program.* B-005-OLC-AB-BS-98-R4 rev. Feb 2006
- < Fact Sheet: *Sediment Contaminant Monitoring Program.* B-008-OWQ_BS-98-R4 rev. Feb 2006
- < Fact Sheet: *Macroinvertebrate Community Assessment Program.* B-007-OWQ-AB-BS-98-R4 rev. Feb 2006
- < Fact Sheet: *Lake Monitoring Program.* A-009-OWQ-A-BS-98-R4 rev. Feb 2006

Contact Information

C. Lee Bridges, Section Chief
Indiana Department of Environmental Management
Office of Water Quality – Assessment Branch
Biological Studies Section
100 North Senate Avenue
MC65-40-2 Shadeland
Indianapolis, IN 46204-2251
Phone: (317) 308-3183
Fax: (317) 308-3219
E-mail: lbridges@idem.IN.gov

<p>IDEM Information: (317) 232-8603 or 800-451-6027 800-743-3333(TDD) toll-free for Indiana residents www.IN.gov/idem/water/</p> <p>Report Environmental Emergencies: (888) 233-7745</p> <p>Confidential Technical Assistance: (800) 988-7901</p> <p>Pollution Complaint: www.IN.gov/idem/pollutioncomplaints/</p> <p>Questions and Comments: www.IN.gov/idem/contact/questions.html</p>	<p><u>For More Information on IDEM's Office of Water Quality...</u></p> <p>Assessment Branch (Surface water quality monitoring: rivers and streams, lakes, water quality standards) Shadeland Office, Indianapolis (317) 308-3173</p> <p>Compliance Branch (Compliance and inspections, data and information services, wastewater certification and continuing education) Indiana Government Center North, Indianapolis (317) 233-2545</p> <p>Drinking Water Branch (Public water supply supervision and ground water protection) Shadeland Office, Indianapolis (317) 308-3308</p> <p>Permitting Branch (Facilities Construction & Engineering Support, Industrial & municipal permits, modeling, and wet weather) Indiana Government Center North, Indianapolis (317) 232-8760</p> <p>Watershed Planning Branch (Rules development, wetlands, TMDL, watershed management) Indiana Government Center North, Indianapolis (317) 233-8488</p>
---	--